

spent two years (1881-3) in Madras. The department thus created has grown until it has now an area of 239,000 square miles, equal to twice the area of Great Britain and Ireland, under its management.

When Brandis first started operations he had to do with what staff he could lay his hands on; but he determined to obtain one fit to deal with the requirements of the case. In 1866, while on sick leave in England, he obtained the sanction of the late Lord Salisbury, then Secretary of State for India, to train young Englishmen in Continental forest schools, and under this scheme a number of highly qualified foresters have been sent to India. The training at Continental forest schools was subsequently supplanted by that at Coopers Hill College, and now at the University of Oxford.

But Brandis went a step further. In 1878 he started a forest school at Dehra Dun for the training of natives of India, which has now been raised to the rank of "The Imperial Indian Forest College," and sends annually from forty to fifty trained executive officers into the service.

By this means a trained staff of 200 Englishmen have been obtained, who control the operations of the forest department, assisted by about 11,000 native officials of various grades. The results are most gratifying. The supply of timber, firewood, grass, and other produce for the teeming millions of India has been placed on a satisfactory footing, while the net revenue from the forests has risen from 40,000*l.* in 1864 to 660,000*l.* in 1904, although produce valued at a similar sum is given free to the people of the country.

During his career in India Brandis wrote an endless number of reports, and in 1874 he brought out the "Forest Flora of North-west and Central India," a work which was so highly thought of by Sir Joseph Hooker and others that he was made a Fellow of the Royal Society in 1875. It may not be generally known that Brandis was the first who compiled a rainfall map of India; it has been improved since, but as regards the main points it holds good to this day.

Brandis retired from the Indian service in 1883, at the age of fifty-nine years; but he continued to devote himself to the advancement of forest conservancy in India, by articles and letters of advice to his friends in India. From 1888 to 1896 he superintended the practical instruction in Germany of the Coopers Hill forest students.

The last eight years of his life he devoted to the writing of a general Indian forest flora, which he published in 1906 under the title of "Indian Trees," a monumental work, which is likely to be the standing book of reference on the subject for another generation. Scarcely had he completed this when he fell ill, and he never rose from his sick bed. He was made a C.I.E. in 1876, and a K.C.I.E. in 1887.

It should not be omitted to mention that Brandis had a great share in the development of forest conservancy in the United States. He guided the studies of quite a number of young Americans, who have since established a great department in the United States. His influence in this respect has been so great that President Roosevelt presented him with his picture and the following dedication:—"To Sir Dietrich Brandis in high appreciation of his services to forestry in the United States, from Theodore Roosevelt."

Apart from India and the United States, Brandis's action has been felt in almost all parts of the British Empire, including these islands. He has left his mark upon every continent of the earth; at any rate, his name will go to posterity as the father of systematic forest management in the British Empire.

W. SCHLICH.

NOTES.

WE regret to learn that Dr. Maxwell T. Masters, F.R.S., whose writings on botanical and horticultural subjects are familiar to many readers of NATURE, died on May 30 at seventy-four years of age.

THE annual *conversazione* of the Institution of Electrical Engineers will be held at the Natural History Museum, Cromwell Road, on Tuesday evening, June 18.

DR. W. S. BRUCE and the remainder of his staff, who are starting on an expedition to the Arctic, have left Edinburgh for Spitzbergen. The expedition will finally be relieved and brought back to Europe by the Prince of Monaco on board his yacht the *Princess Alice*.

PROF. PAUL EHRLICH will deliver the second and third of his series of Harben lectures of the Royal Institute of Public Health on Friday, June 7, and Tuesday, June 11. The subject of the lectures is "Experimental Researches on Specific Therapeutics," and they will be delivered at the Royal Medico-Chirurgical Society, 20 Hanover Square, at 5 p.m. on each day.

GILBERT WHITE's autograph manuscript of his "Natural History and Antiquities of Selborne," in the form of letters to Thomas Pennant and Daines Barrington, and arranged in a folio volume, will be sold by Messrs. Sotheby on July 1. The MS. remained in the possession of the author's descendants until 1895, when it was sold at Sotheby's and acquired by the present owner, Mr. Stuart M. Samuel, M.P.

THE council of the Society of Arts, with the approval of His Royal Highness the Prince of Wales, its president, has awarded the Albert medal of the society for the current year to the Earl of Cromer. "In recognition of his pre-eminent public services in Egypt, where he has imparted security to the relations of this country with the East, has established justice, restored order and prosperity, and, by the initiation of great works, has opened up new fields for enterprise."

At a meeting of the Corporation of the City of London on May 30, the Lord Mayor presiding, it was decided unanimously to present the freedom of the City to Lord Lister and the Earl of Cromer. Mr. Alderman Alliston, in moving that the honorary freedom of the City be presented to Lord Lister in a gold box, in recognition of his eminence as a surgeon and the invaluable services he has rendered to humanity by the discovery of the antiseptic system, remarked that more than one hundred years have elapsed since the Court bestowed the freedom of the City on a member of the medical or surgical profession. The last was that given to Edward Jenner, the discoverer of vaccination, in 1803. Since then the Corporation has welcomed Royal personages, great warriors, eminent statesmen, and others, but the still small voice of the personal ills that flesh is heir to—their amelioration and remedy—have, Mr. Alliston pointed out, somewhat escaped the City's notice. The deficiency is now to be rectified, and the City Lands Committee has been empowered to make the necessary arrangements for the presentation of the freedom to Lord Lister at an early date.

ON August 15, weather permitting, the international laboratory for Alpine investigations, at the Col d'Olen, on Monte Rosa, will be formally opened. In two articles contributed by the late Sir Michael Foster to NATURE (vol. lxxv., p. 568, and vol. lxxi., p. 443), he described the laboratory established on the Gnifetti peak of Monte Rosa, at

an altitude of 4560 metres, and referred to the valuable researches at high altitudes carried on in connection with it. The supplementary laboratory shortly to be opened is at an altitude of 3000 metres, and will therefore permit work to be carried on for longer periods and under less difficult conditions than at the higher Gnifetti laboratory. The new building provides accommodation for work in botany, bacteriology, zoology, physiology, terrestrial physics, and meteorology, including material and instruments usually required for investigations at high altitudes. Eighteen investigators can find places in the laboratory, and two of these places are for British men of science. Prof. A. Mosso, Turin, to whose zeal and activity the laboratories largely owe their existence, will give further particulars concerning the conditions under which places in them can be secured by investigators desiring to study physiological and other problems in the High Alps.

PLANS have been perfected recently, we learn from *Science*, for a detailed and systematic investigation of the Atlantic and Gulf Coastal Plain stratigraphy and palæontology. Several State surveys, including those of North Carolina, Georgia, Alabama, and Mississippi, will act in cooperation with the United States Geological Survey. The aim of the work is to determine the extent of the subdivisions recognised in New Jersey and Maryland on the north and Alabama on the south, to determine their relations to one another, and in general to establish satisfactory correlations throughout the district between the Potomac and the Mississippi River. Economic studies, especially on the phosphates, will also be made. The supervision of the work rests with a board of geologists, consisting of the State geologists in the Coastal Plain districts and the chief geologist and chief hydrographer of the national survey, Dr. W. B. Clark being chairman. The field work is in charge of Mr. M. L. Fuller, who will put seven parties into the field during the summer. It is hoped to complete the investigation in Virginia, North Carolina, South Carolina, and Florida within a year, while the work in the remaining States will be finished in 1908 and 1909.

THE closing sitting of the International Association of Academies was held on June 2. An article upon this third general assembly appeared in last week's *NATURE* (p. 105); and the Vienna correspondent of the *Times* gives, in Tuesday's issue, a short account of the proceedings, from which the following report of progress has been derived:—The next meeting will be held in Rome three years hence, and the management of the association during the interval will devolve upon the Accademia dei Lincei. The association has agreed to the issue of a complete and authentic edition of the works of Leibnitz, both the mathematical and the philosophical departments of the association recognising its desirability. Notable progress was reported in the preparation of the great Encyclopædia of Islam, of which Prof. de Goeje, of Leyden, laid before the meeting the first section in three languages—English, French, and German. The ideas of forming a Corpus of Greek documents and a Corpus Medicorum Antiquorum are taking practical shape. The Belgian Government has announced its intention of subsidising the scheme for an international bibliography of historical and philosophical subjects, and it is hoped that support will also be forthcoming from England and America. The proposal that the association should choose an international auxiliary language, such as Esperanto, for use in the communications between members was negatived by twelve votes to eight. The members of the association are gratified by the reception accorded to

each of them personally by the Emperor Francis Joseph, and express warm gratitude for the hospitality extended to them by the Vienna Academy and by the Austrian authorities.

THE accounts which have been published in the Press, through Reuter's Agency, of the expedition of Dr. A. F. B. Wollaston to the Ruwenzori region give a terrible picture of the ravages of sleeping sickness in the Manyema country the sights are described as being fearful, with people dead and dying on the roadside, as it is the custom of those people to turn out stricken natives to die. A similar custom prevails in Uganda, and is inspired by the belief, firmly held by the natives, that persons affected with sleeping sickness are infectious to others living with them. Scientific investigations into the mode of transmission have so far demonstrated, however, only one means of conveying the infection, namely, by the intermediary of tsetse-flies (*Glossina palpalis*, also *G. fusca*, fide Koch). But since the fly has only been shown to transmit the disease by the direct method, that is to say, by taking up into its proboscis from sick persons the parasites which cause the disease, and inoculating them directly into healthy subjects, it seems at least within the bounds of possibility that other biting parasites, such as fleas or lice, might be able to do the same thing. Moreover, in a paper read before the Royal Society last November, Prof. E. A. Minchin suggested the possible occurrence of a mode of infection which he has termed *contaminative*, to contrast it with the ordinary *inoculative* method (see *NATURE*, December 27, 1906, vol. lxxv., p. 214). These suggestions, if confirmed, would account for the native theory of infection. On the other hand, no patient has ever yet been found to be infectious when removed to a healthy region from one where sleeping sickness is rife. It is evident, however, that the etiology of sleeping sickness is a subject which has not been exhausted, since there are several possibilities which require definite proof or disproof.

THE first part of vol. xxix. of Notes from the Leyden Museum is entirely devoted to descriptive zoology, and therefore mainly interesting to specialists. Reference may, however, be made to the description, by Dr. Jentink, of a new bat of the genus *Taphozous* from Batavia, which, in the possession of a wing pouch and a gular sac, approximates to the rare *T. longimanus* of India.

IN the course of an editorial note in reference to the photograph of the skull of a hippopotamus which forms the frontispiece to the April number of the (*Haslemere*) *Museum Gazette*, it is stated that "the hippopotamus has its nearest British alliance in the pig, but unlike the latter, it has four toes." We are led to wonder how many digits the editor considers a pig to possess. We are also surprised to learn (p. 564) that *Proechidna* takes the place in New Guinea of *Echidna* in Australia, seeing that zoologists recognise a local race of the latter from Port Moresby. As to the list of mammalian names on p. 569, perhaps the less said the better.

THE structure and physiology of the male generative organs of the dibranchiates forms the first part of a critical study of cephalopod molluscs in general, by Mr. W. Marchand, of Leipzig, now in course of issue in the *Zeitschrift für wissenschaftliche Zoologie*, this instalment appearing in vol. lxxv., part iii. As the result of his investigations, the author concludes that modern pelagic dibranchiates, in which the sexes are distinct, are the descendants of non-pelagic hermaphrodite forms, with

longer bodies and "shells." The question as to whether these hypothetical ancestral types are represented by the belemnites is discussed towards the close of the paper.

JUDGING from the annual report for 1905-6, affairs have not been working quite smoothly at the Indian Museum. A proposal has been made that the museum should be divided into several sections (including one devoted to art), and that the whole establishment should be presided over by a director who should not be a zoologist. Exception is taken to this proposal by the superintendent of the natural history section, who also expresses himself somewhat strongly with regard to the uses to which some of the galleries under his charge have recently been put. "I feel it my duty," he writes, "to record that this section has of late been seriously embarrassed and discouraged by a series of sudden evictions from its galleries and by constant schemes of Museum reorganisation in which its well-established claims, and the interests of zoology in general, have not received sufficient consideration." The zoological collections, with the exception of the insects (which suffer from the climate), are in the main in satisfactory condition, and have largely increased during the period under review.

THE annual return of experiments performed under the Vivisection Act has just been issued. In all, 46,073 experiments were performed by 279 licensees, of which 43,287 were of the nature of simple inoculations, hypodermic injections, &c. Nearly 6000 experiments were performed for Government departments, county councils, municipal corporations, and other public health authorities; 2144 experiments were performed for the Royal Commission on Tuberculosis, 8659 for the Imperial Cancer Research Fund, 4732 for the preparation and testing of therapeutic sera and vaccines, and 1079 for the testing and standardising of drugs. Irregularities occurred in the case of four licensees, the result of inadvertence or misunderstanding. The inspectors report that they have made the usual visits of inspection of registered places, and found the animals suitably lodged and well cared for, and the licensees attentive to the requirements of the Act.

A NUMBER of excellent illustrations of Maoris and others at the New Zealand International Exhibition are given in the *Weekly Press* (Christchurch, N.Z.) for December 12, 1906. One series shows the "Canoe dance," in which an elaborate story is told in pantomime by means of the *poi*, a small ball of rawhide, at the end of a string of flax. Another series deals with the Fijian fire-walkers, whose performances were discussed in NATURE some years ago, and were the subject of a paper in the Proceedings of the Victorian Branch of the Royal Geographical Society of Australasia in 1892. There is also an excellent full-page plate of a Fijian dancing party.

THE Journal of the Anthropological Institute, vol. xxxvi., part ii., contains Prof. Petrie's Huxley lecture, illustrated by twenty-eight maps, mainly of Central Europe, with an appendix on the interpretation of curves. Mr. Torday continues his excellent series of papers on the tribes of the Congo, and, in collaboration with Mr. Joyce, deals with the Bahuana. Dr. C. S. Myers publishes two parts of his anthropometric survey of modern Egypt, treating of the Mohammedans and comparing them with the Copts and the "mixed" group. Mr. G. U. Yule attacks the validity of Dr. Karl Pearson's statistical methods in cases where ill-defined qualities, such as shades of colour, are in question. MM. Frič and Radin deal with the Bororo of central Brazil; a great part of their paper is devoted to

ornaments, weapons, and music. Other papers in this part are by Miss Layard on the Ipswich Palæolithic site, and by Mr. Parkinson on the Ibos; Major Sykes publishes a second vocabulary of the Gipsies of Persia, giving words from three districts for comparison with Prof. de Goeje's Armenian and Egyptian lists. The number contains twenty plates, which, as usual, are of a high standard, both as regards interest and workmanship.

THOSE mysterious prehistoric excavations—the dene-holes—are found in great numbers in the neighbourhood of Bexley, some five miles from Woolwich, and in smaller numbers near Grays, in Essex, and numerous other localities in east, south-east, south, and south-west of England. Some recent explorations have unearthed a few more interesting evidences of their antiquity, and thrown a little more light on the problem of their origin. In sinking a shaft at Gravesend lately, the workmen discovered the nether cavity of a dene-hole, which had been almost entirely filled in by subsidences. The shaft was quite filled up, but the bee-hive chamber at the bottom is now being cleared of rubbish, and in the sand and earth a number of partially worked axe-heads of flint have been found, together with the bones and skull of an animal, probably a wolf, which are now being identified. The walls are covered with pick-marks, which seem to have been made with an instrument of either wood or bone, possibly a pick made of an antler.

In the *Biologisches Centralblatt* (May 1) Prof. Haberlandt returns to his theory that the leaves of certain plants are enabled to perceive the stimulus of light because their epidermal cells are domed and function as lenses, whence he calls them "ocelli," since they resemble a primitive eye. He has somewhat modified his previous explanation, as follows:—If the light falls obliquely on the leaf, the rays act as a "tropic" or directive stimulus on the plasma-lining of the cell, causing the leaf to turn until it lies at right angles to the incident rays. In support of his theory, Prof. Haberlandt demonstrated that the cells can be prevented from functioning as lenses if the leaves are immersed in water, because the convexity is nullified by the water having a refractive index almost equal to that of the cell sap; to meet the arguments of critics he now shows that a continuous film of water on the surface is sufficient to prevent the leaf from turning.

An article on the hybridisation of wild plants was contributed by Prof. D. T. MacDougal to the *Botanical Gazette* (January). The principal subject of examination was the oak tree, *Quercus heterophylla*, characterised by the veining and indentation of its leaves, that has generally been accepted as a hybrid. The author adduces evidence from the cultivation of seedlings in favour of regarding the species as a hybrid between *Quercus Phellos* and *Quercus rubra*. The article is, however, more important on account of the general remarks as to the methods of tracing supposed hybrids. Occasionally a hybrid may be synthesised from its supposed parents; sometimes evidence may be obtained from anatomical examination of the hybrid and parents, or, as in the present case, from cultures of the seedlings. These methods are, however, fraught with pitfalls that are better understood since the elaboration of the Mendelian principles.

In connection with the silting up of Karachi harbour, Mr. G. K. Betham advances the opinion, in the *Indian Forester* (March), that much advantage might be derived from calling in the services of the forestry department.

The source of the enormous deposits of sand is traced partly to the sediment brought down by the Indus and partly to the drift from the littoral of Mirpur Sakro lying to the south-east of Karachi. While the control of the waters of the Indus is primarily the work of the irrigation department, it is urged that it would be possible to reduce materially the sediment if the banks and certain deposits, "kachas" in the upper waters were protected by planting with such grasses as *Typha elephantina*, *Eragrostis cynosuroides*, and *Eleusine aegyptiaca*. The problem of checking the sand drift from Mirpur Sakro is essentially one for the forester, and Mr. Betham maintains that, despite the want of water, it would be possible to develop plantations of *Casuarina*, tamarisks, and Agave.

DR. N. M. STEVENS, in Publication No. 36 of the Carnegie Institute of Washington, has given an interesting account of his investigations on the so-called heterochromosomes in a number of insects, especially the beetles. These chromosomes commonly form a pair differing in size from the rest of these nuclear bodies. One of the pair is smaller than the other, and this may go so far as to culminate in its entire suppression. The special point of interest attaching to these heterochromosomes lies in their different behaviour in the male and female animal respectively. The female always possesses an equal pair, and in those forms in which the small one has entirely disappeared from the cells of the male its surviving counterpart is still preserved in the female. A comparison of the eggs and sperms brings out the remarkable fact that half the eggs contain, and half quite lack, the large chromosome, whilst similarly the sperms, four of which are produced from each mother cell, divide the big and little ones between them when both are present, or they lack them altogether when they are absent from the somatic cells of the species. Thus it comes about that on fertilisation, on the average, half the offspring possesses, and half are destitute of, the large chromosome. Stevens correlates these remarkable nuclear characters with the differentiation of sex, but exercises a judicious restraint in forcing his conclusions. The paper contains full details, and should be consulted by those interested in these matters.

At the annual meeting of the American Antiquarian Society on October 24, 1906, Dr. A. Lawrence Rotch read a paper entitled "Did Benjamin Franklin Fly his Electrical Kite before he Invented the Lightning Rod?" It is generally supposed that the kite experiment led to the invention of the rod, but Dr. Rotch's researches seem to show that the experiment was probably performed later than has been supposed (June, 1752), and that before then certain buildings in Philadelphia were provided with "points," probably as lightning conductors, and, further, that prior to Franklin's first account of the kite experiment he had drawn up precise directions for the erection of lightning rods. These directions were printed in "Poor Richard's (Improved) Almanac" for 1753, which was advertised in the *Pennsylvania Gazette* of October 19, 1752, as being then in the press. It is admitted that Franklin suggested the possibility of the lightning rod as early as 1750, but the directions referred to by Dr. Rotch and reprinted in his paper show that it was probably invented about a year earlier than has been supposed.

THE twenty-ninth report of the work of the Deutsche Seewarte, Hamburg for the year 1906, shows that, in common with other national meteorological organisations,

the scope of its operations is constantly increasing, with the result that some important investigations necessarily fall into arrear, e.g. the publication of the valuable "Daily Synoptic Weather Charts for the North Atlantic Ocean," undertaken in conjunction with the Danish Meteorological Office, which had commenced its twentieth year at the time of the issue of the Hamburg report for 1906. With regard to the necessary collection of trustworthy observations at sea, we observe that the Deutsche Seewarte received in 1906 some 1592 logs of different kinds from Imperial and mercantile vessels, containing 3627 months' observations. The observers are encouraged by the award of medals and diplomas, as well as by liberal presentation of publications. The department dealing with agricultural meteorology has greatly enlarged the area of its work, and issues special weather forecasts and charts in connection with that service. The important investigation of the upper air by means of kites and balloons is continued whenever practicable; 206 kite ascents were made in the year.

In the *Geological Magazine* for April, Mr. G. J. Williams discusses the geological age of the Parys Mountain, Anglesey, and finds a number of fossils recently discovered in shale beds opened up by the boring of a tunnel in the Mona Mine.

PROF. CHARLOTTE A. SCOTT contributes to the *Annals of Mathematics*, viii., 3, an interesting note showing how the regular polygons of five, seven, or nine sides can be constructed by determining four of their vertices as the points of intersection of a circle and a rectangular hyperbola.

In the *Journal de Physique* for May, M. Ch. Maurain discusses the influence of torsion on magnetisation, and refers to the methods adopted in order to separate the effects of torsion from those of hysteresis. This paper may with advantage be taken in conjunction with one by K. Honda and T. Terada on the change of elastic constants of ferromagnetics, published in the *Journal of the College of Science (Tokyo)*, vol. xxi., art. 4.

An interesting paper on the genesis of mathematics is contributed by M. Jules Sageret to the *Revue scientifique* (vii., 19). The author gives a detailed account of Rouse Ball's observations on the Rhind papyrus, and refers to Tannery's conclusions regarding the work of the geometrical schools of Thales and Pythagoras. He considers that mathematics originated out of an empiricism which might have attained a high stage of development before any science came into existence, and that the fertile germ came from certain metaphysical ideas of imagination (shall we say intuition?) in the early ages of human thought. The genesis of mathematics differed from that of other sciences owing to the important part played in the latter by experience and observation. We can only wish that papers on the lines of M. Sageret's appeared more frequently in popular journals in Britain. They would do much to remove that unpopularity of mathematical study which arises from a too exclusive consideration of the mere examination ideal.

In the *Psychological Bulletin* (iv., 4), Mr. David Coyle contributes a note on the inversion of the image in vision, and points out that the eye-movement theory of upright vision does not necessitate the inversion of the retinal images. In other words, an organism fitted with an eye capable of giving an upright image would execute the same eye-movements in turning its eye towards any definite object. In connection with this simple result, it might be interesting to direct attention also to the ease with

which a microscopist can pick out diatoms under a non-erecting microscope, where the eye-movements are opposite in direction to the movements of the hand, showing how readily even the eye-movement sense of direction can be reversed by habit.

An interesting contribution to the study of the so-called "addition-compounds" is contained in a paper by L. Mascarelli and U. Ascoli in the *Gazzetta* (vol. xxxvii, 1, 125). Many aromatic nitro-compounds combine with mercuric chloride or bromide to form "salts" analogous to those obtained from the corresponding iodoxy derivatives. Most of the substances formed in this way are, however, comparatively unstable, undergoing dissociation into their constituents in presence of the ordinary solvents; none of them has a true melting point. Their formation, however, is clearly demonstrated by the manner in which the melting point of the nitro-compounds varies as the mercuric haloid is added. The salts formed with mercuric chloride are more easily obtained than those derived from mercuric bromide, whilst mercuric iodide fails to give additive compounds at all.

MESSRS. A. GALLINKAMP and Co. have sent us a copy of their catalogue of bacteriological and hygienic apparatus. It forms a volume of 160 pages, is profusely illustrated, and every piece of apparatus likely to be of use in laboratories of bacteriology and hygiene seems to be included.

MR. EDWARD STANFORD has published a second edition of his Geological Atlas of Great Britain and Ireland, based on Reynolds's Geological Atlas, which was reviewed in NATURE on February 2, 1905 (vol. lxxi, p. 315). The new edition is, like its predecessor, preceded by descriptions of the geological structure of Great Britain and its counties and of the features observable along the principal lines of railway. Mr. H. B. Woodward, F.R.S., the editor of the atlas, has added to the new edition, however, a sketch of the geological features of Ireland, its counties, and main lines of railway, and this subject is illustrated by geological maps of the country. A full list has been appended of the figured fossils, with indications of their zoological position and range in time.

MR. ROBERT SUTTON has published a third edition of Mr. T. Charters White's handbook for beginners on "The Microscope and How to Use it." Mr. Maurice Amsler has contributed to the new edition a chapter on staining bacteria, and the author has added a chapter on the marine aquarium as a field for microscopical research. The price of the new issue is 3s. net.

A CLASSIFIED list of publications of the Smithsonian Institution available for distribution as an aid to research or study has just been published by the institution. The list contains the titles of about one thousand papers, memoirs, and reports upon scientific subjects, grouped, so far as possible, according to the system of the International Catalogue of Scientific Literature, and arranged in each group alphabetically according to names of authors. Many of the papers can be obtained upon application by investigators interested in the subjects with which they deal, and others can be purchased at a nominal price from the Smithsonian Institution, Washington, D.C., U.S.A.

ANOTHER new edition—the fifth—of Mr. R. Kearton's "Wild Life at Home" has been published by Messrs. Cassell and Co., Ltd. The increasing popularity of what Mr. Kearton aptly calls "this new and bloodless form of sport" is a hopeful sign, as likely to lead to an increase of knowledge of the natural surroundings of living animals and their characteristics in the wild state. Mr. Cherry

Kearton's photographs are both remarkable and artistic, and some of them provide abundant evidence that the peaceful sportsman need not lack the excitement which comes from danger to life and limb. The hints given how to study and photograph wild life should prove invaluable to naturalists beginning work in this direction.

OUR ASTRONOMICAL COLUMN.

A NEW COMET.—A telegram from Kiel announces the discovery of a thirteenth-magnitude comet by Prof. Giacobini, at Nice, on June 1.

The comet's position at 10h. 54.7m. (Nice M.T.) was

R.A. = 20h. 14m. 15.7s., Dec. = +24° 4' 41",

very near to Leonor.

The daily movement is given as +1° 10' in R.A. and -36' in declination.

SEARCH-EPHEMERIS FOR COMET 1900 III. (GIACOBINI).—A continuation of Herr Scharbe's ephemerides for comet 1900 III., during the apparition of 1907, is given in No. 4177 (p. 11, May 18) of the *Astronomische Nachrichten*.

These ephemerides give the positions, for every eighth day, from May 2 to July 27, for ten different values of the comet's daily movement, the normal argument being that perihelion will be passed on June 8.

COMET 1905 IV.—A further instalment of the ephemeris for comet 1905 IV. is given by Prof. Weiss in No. 4177 (p. 12, May 18) of the *Astronomische Nachrichten*.

This comet has been under observation for nearly 2½ years, and is now so faint (mag. = 14.0 approx.) that it will only be observed with the largest instruments. The present ephemeris gives the position of the comet at 12h. (M.T. Berlin) for 1907.0, and extends from June 1 to August 12.

DISCOVERY OF A SECOND ASTEROID NEAR JUPITER.—An investigation of the orbit of the minor planet 1907 XM, which was discovered by Dr. Kopff at Heidelberg on February 10, has been carried out by Dr. E. Strömberg, and has led to the interesting result that this asteroid is similar to (588) [1906 T.G.] in that its abnormally great aphelion distance lies in the immediate neighbourhood of Jupiter's orbit. The elements, derived from observations made on February 10, March 11 and 21, and April 12 and 16, are as follows:—

Epoch 1907 February 10.0 (M.T. Berlin).

$$\begin{array}{ll} M = 335^{\circ} 47' 12'' & \phi = 2^{\circ} 8' 23'' \cdot 6 \\ \infty = 183^{\circ} 51' 51'' & \mu = 292'' \cdot 584 \\ \delta = 341^{\circ} 58' 21'' & 1907 \cdot 0 \quad \log a = 0 \cdot 722504 \\ i = 18^{\circ} 7' 16'' \end{array}$$

From the above it is seen that the length of the semi-major axis of this planet's orbit is roughly 5.28 astronomical units, that of Jupiter being 5.20.

This discovery of a second asteroid near Jupiter raises the question as to whether we are just discovering a hitherto unknown group of minor planets which for ages has been retained by the major planet in the neighbourhood of his orbit, or are dealing with the harbingers of an extension of the system of minor planets. The importance of answering this question is a further justification for vigorously prosecuting the apparently endless business of asteroid discovery (*Astronomische Nachrichten*, No. 4177, p. 13, May 18).

THE ECLIPSE OF JANUARY 14, 1907.—The official report of M. Milan Stefánik's expedition to Ura-Tjabe (Russian Turkestan) to observe the total eclipse of the sun which took place on January 14 is published in the *Comptes rendus* for May 14. His intended observations—like those of MM. Belopolsky, Hansky, and Wittram, who occupied the same station—were prevented by a snowstorm, which commenced on the eve of the eclipse and continued without interruption until the evening of January 15. The crescent sun was glimpsed but once, at twelve minutes before third contact. At the time of totality the darkness was not profound, the earth and sky being of a purplish-blue tint. The passage of the moon's shadow on the lower layer of cloud was plainly visible.